

10/050,454

F0604

---

### AMENDMENTS TO THE CLAIMS

This listing of claims replaces all prior versions, and listings, of claims in the application:

### LISTING OF CLAIMS

1. (Original) A semiconductor processing system, comprising:  
a processing chamber operable to form a seed layer conformally over a barrier layer, the barrier layer formed conformal to a trench and to a substrate located in the chamber, wherein the trench is formed in the substrate; and  
an x-ray scattering measurement system for measuring in-situ a thickness of the seed layer at sidewall portions of the trench while the seed layer is being formed and for providing a measurement signal indicative of the measured thickness.
2. (Original) The system of claim 1, further comprising a control system for controlling operating characteristics of the formation environment within the chamber, the control system adjusting the operating characteristics to control formation of the sidewall portions based on the measurement signal.
3. (Original) The system of claim 2, further comprising a seed layer material distribution system operable to conformally deposit seed layer material onto the barrier layer to form the sidewall portions, the seed layer material distribution system being controlled by the control system.
4. (Original) The system of claim 1, wherein the measurement system is an x-ray reflectometry system.

10/050,454

F0604

5. (Original) The system of claim 4, wherein the x-ray reflectometry system includes a polychromatic x-ray light source for generating a spectrum of incident angles at the sidewall portions and a detector to measure an intensity of reflected x-rays as a function of the incident angles.

6. (Original) The system of claim 5, the detector transmitting the measured intensity of the reflected x-rays with respect to the incident angles to a control system, the control system being further adapted to generate a signature of the spectrum of reflectivity as a function of the incident angles that corresponds to the thickness of the sidewall portions.

7. (Original) The system of claim 6, further comprising a library of signatures corresponding to various thicknesses of the sidewall portions, the control system being adapted to search the library for a match to the generated signature to determine a thickness of the sidewall portions individually.

8. (Original) The system of claim 6, further comprising a library of signatures corresponding to various profiles of the sidewall portions, the control system being adapted to search the library for a profile match to the generated signature to determine a profile and a thickness of the sidewall portions.

9. (Original) The system of claim 6, wherein the control system controls a formation time period during which the sidewall portions are formed, the control system controlling the formation time period based on the determined thickness.

10. (Original) The system of claim 9, the control system generating a reflectivity signature component and scattering angle component corresponding to the

10/050,454

F0604

---

sidewall portion thickness.

11. (Original) The system of claim 1, further including a display operatively coupled to the control system and operative to display a visual representation of the determined thickness of the sidewall portions during fabrication.

12. (Original) The system of claim 1, the seed layer being formed of a copper alloy such as copper-zinc, copper-aluminum, copper-zinc-aluminum, copper-nickel, copper-silver, copper-gold, copper-platinum and copper-paladium, or a combination thereof.

13-20. (Withdrawn)